NASA News

National Aeronautics and
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For Release:

IMMEDIATE

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RELEASE NO: 78-45

TILT ROTOR RESEARCH AIRCRAFT GOES TO AMES

A new aircraft combining features of both airplanes and helicopters is scheduled to arrive at NASA's Ames Research Center, Mountain View, Calif., this month.

The XV-15 Tilt Rotor Research Aircraft has wing-tip-mounted turbine engines which turn 7.6-meter (25-foot) prop rotors. The engine-prop rotor assembly can be tilted up for helicopter-type vertical takeoff and landing, or oriented forward in the normal manner for conventional flight as an airplane.

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(NASA-News-Release-78-45) TILT ROTOR RESEARCH AIRCRAFT GOES TO AMES (National Aeronautics and Space Administration) 3 p

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Two research aircraft are being built under a joint program by Ames Center and the U.S. Army's Research and Technology Laboratories (AVRADCOM) at Moffett Field, Calif., by Bell Helicopter Textron, Fort Worth, Texas.

The first XV-15 to arrive at Ames has been modified for remote control operation and will undergo six weeks of testing in the Ames 12.2 by 24.4-m (40 by 80 ft.) wind tunnel. Flight testing of the number two aircraft at the Bell facilities in Forth Worth will begin following the wind tunnel tests.

Both aircraft will eventually be based at Ames for comprehensive evaluation of the tilt rotor concept by the Army and NASA. They will also serve as research aircraft to provide data for terminal area (airport) navigation, and vertical and short takeoff and landing programs underway at Ames.

Advantages of the tilt rotor concept are significant. While this type of aircraft can fly at speeds comparable to conventional fixed-wing turboprop planes, a terminal designed for vertical takeoffs and landings requires far less land area than needed for conventional airports and can, therefore, be located closer to population centers.

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For military use, tilt rotor aircraft can combine the tactical utility of helicopters with the advantages of longer range, higher speed transport aircraft. Potential future military missions include search and rescue, reconnaissance and surveillance, and troop transport.

The XV-15 cruise speed is about 550 kilometers per hour (340 miles per hour), twice as fast as present helicopters. It is designed to be much quieter than today's helicopters and turboprop planes.

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RELEASE NO: 78-39

EXPERIMENTS CHOSEN FOR SOLAR POLAR MISSION

Thirty scientific experiments have been tentatively selected by NASA and the European Space Agency (ESA) for the proposed Solar Polar Mission.

The two-spacecraft mission, planned for launch in 1983, is designed to observe the Sun for the first time from the unique perspective of its polar regions.

In doing this, the Solar Polar Mission will explore one of the remaining frontiers of the solar system, namely the third dimension of space away from the plane of the orbits of of the planets.

(NASA-News-Release-78-39) EXPERIMENTS CHOSEN FOR SOLAR POLAR MISSION (National Aeronautics and Space Administration) 8 p

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Unclas
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All previous interplanetary space probes have flown in the orbits of the planets, which essentially intersect the Sun's equatorial regions.

NASA emphasized that the project has not yet been approved by Congress, but said that early selection of scientific participants and investigations allows for a prompt start when approval is received.

NASA and ESA are providing one spacecraft each, and the combined scientific payload is divided between U.S. and European investigators.

Both spacecraft will be launched simultaneously by the Space Shuttle and then directed on a trajectory in the ecliptic plane (the plane which contains all of the planets) to Jupiter by an Inertial Upper Stage booster.

The two spacecraft will swing around Jupiter and use the gravity of that giant planet to redirect their paths out of the ecliptic plane back toward the Sun in trajectories -- one northbound and one southbound -- that are essentially mirror images of each other.

They will pass over the north and south solar poles, swing through perihelion (the distance closest to the Sun) in the ecliptic plane, pass respectively over the other solar poles and then fly back out to the vicinity of Jupiter's orbit.

The period from launch until shortly after the second pair of polar passages is approximately five years.

The investigations are expected to return important new knowledge on the solar wind, cosmic rays and the three-dimensional structure and evolution of the Sun's corona (the outermost solar atmosphere). This information, in turn, will contribute to an understanding of the solar phenomena that shape and control our own planet's space environment.

Scientists now know that the high energy streams which are in the solar wind originate mainly in solar polar regions. In some way, these find their way to Earth, which is in the plane passing through the Sun's equator. These energetic streams may play an important role in weather changes. The Solar Polar Mission will shed light on this important question. The sources of these streams, the solar "coronal holes," exist primarily in solar polar regions, even during those times in the solar cycle when there is little solar activity.

The advantages of a dual spacecraft mission are significant. Sending spacecraft simultaneously over each of the opposite solar poles allows comparisons of the various solar and interplanetary phenomena that are affected by the differences in solar activity that typically occur between the northern and southern solar hemispheres. This duality of spacecraft greatly enhances the ability to understand how various solar activities affect the velocity, composition, density and magnetic field structure of the solar wind flow that impinges on the Earth's magnetosphere.

According to current plans, the northbound polar craft will spend about 110 days observing above a solar latitude of 60 degrees before swinging down over the southern half of the Sun. The southbound polar craft will move in an orbit that is a near-mirror image about the ecliptic plane of its companion.

In anticipation of a fiscal 1979 Congressional authorization of the mission, NASA's Jet Propulsion Laboratory, Pasadena, Calif., who will manage the mission for NASA, is supporting studies of the U.S. spacecraft, payload and mission design concepts.

More than 150 American and European scientists will participate in the Solar Polar investigations.

Titles of the 30 experiments tentatively selected and the Principal Investigators or Co-Principal Investigators of each are as follows:

M. H. Acuna NASA Goddard Space Flight Center	Magnetic Field Experiment
George Gloeckler University of Maryland John Geiss University of Bern, Switzerland	Solar Wind Ion Composition Spectrometer and Studies
E.C. Stone California Institute of Technology	Comprehensive Particle Analysis System
T.L. Cline Goddard Space Flight Center	Solar X-ray Flare and Cosmic Gamma Ray Burst Experiment
S.J. Bame Los Alamos Scientific Laboratory, N.M.	Plasma Spectrometer Experiment
R.M. Macqueen High Altitude Observatory Boulder, Colo.	White Light Coronograph/X-ray XUV Telescope Experiment
J.A. Simpson University of Chicago	Cosmic Ray and Solar Particle Investigation
L.J. Lanzerotti Bell Laboratories, Murray Hill, N.J.	Heliosphere Instrument for Spectrum, Composition and Anisotropy at Low Energies (Partial Selection)
R.G. Stone Goddard Space Flight Center	Plasma Waves and Radio Observations
J.L. Weinberg State University of New York at Albany	Photopolarimetry and Imaging During the Mission: Interplanetary, Astronomical and Planetary (Partial Selection in Collaboration with Giese)
E.J. Smith NASA Jet Propulsion Laboratory	Magnetic Field Investigation

K.C. Hurley Centre d'Etude Spatial des Rayonnements -- Toulouse, France; and Michael Sommer Max Planck Institute, Garching, Germany	Measurement of Solar X-radiation, Cosmic Gamma Ray Burst and Jovian X-rays
Horst Kunow University of Kiel, Germany	Dual Janus Bidirectional Solid State Telescope for Solar and Galactic Cosmic Rays
P.C. Hedgecock Imperial College, London	Interplanetary Magnetic Field Measurements in the Heliosphere
R.H. Giese Ruhr-Universitat Bochum, Germany	Out-of-Ecliptic Zodiacal Light Experiment (In Collaboration with Weinberg)
Eberhard Grun Max Planck Institute Fur Kernphysik Heidelberg, Germany	Out-of-Ecliptic Cosmic Dust Experiment
Helmut Rosenbauer Max Planck Institute Lindau, Germany	Direct Measurement of the Fluid Parameters of the Nearby Interstellar Gas Using Helium as a Tracer
Helmut Rosenbauer Max Planck Institute	Mass Separating Solar Wind Experiment
C. P. Sonett University of Arizona	Interdisciplinary and Theoretical Investigations
J.R. Jokipii University of Arizona	Cosmic Rays and Their Interaction in the Heliosphere and Galaxy
J.C. Brandt Goddard Space Flight Center	Calibration of Ground Based Cometary and Interplanetary Scintillation Solar Wind Measurements with In-Situ Spacecraft Data
L. Fisk University of New Hampshire W.I. Axford Max Planck Institute Lindau, Germany	A Theoretical Team to Support the Out-of-Ecliptic Mission

Aaron Barnes NASA Ames Research Center	Theoretical Studies of the Dynamics of the Solar Wind
Giancario Noci Arcetri Observatory, Italy	Dependence of Mass Flow and Ion Composition of the Solar Wind on Heliographic Latitude
Joseph Lemaire Institute D'Aeronomie Spatiale de Belgique, Brussels	Interdisciplinary Study of Discontinuities and Current Sheets in the Solar Wind
P.S. Callahan Jet Propulsion Laboratory	An Investigation of Changes in the Electron Columnar Content Using Dual Frequency Radio Metric Tracking
P.B. Esposito Jet Propulsion Laboratory	Radio Science Investigation
Hans Holland University of Bonn, Germany	X/X-Band Faraday Rotation and Dispersion Measurements During Solar Occultation of the Spacecraft
H.D. Wahlquist Jet Propulsion Laboratory	Experiment Gravity: (1) Gravitational Radiation, and (2) Celestial Mechanics
Bruno Bertotti University of Pavia, Italy	Detection of Gravitational Wave Bursts from the Nuclei of Distant Galaxies and Quasars

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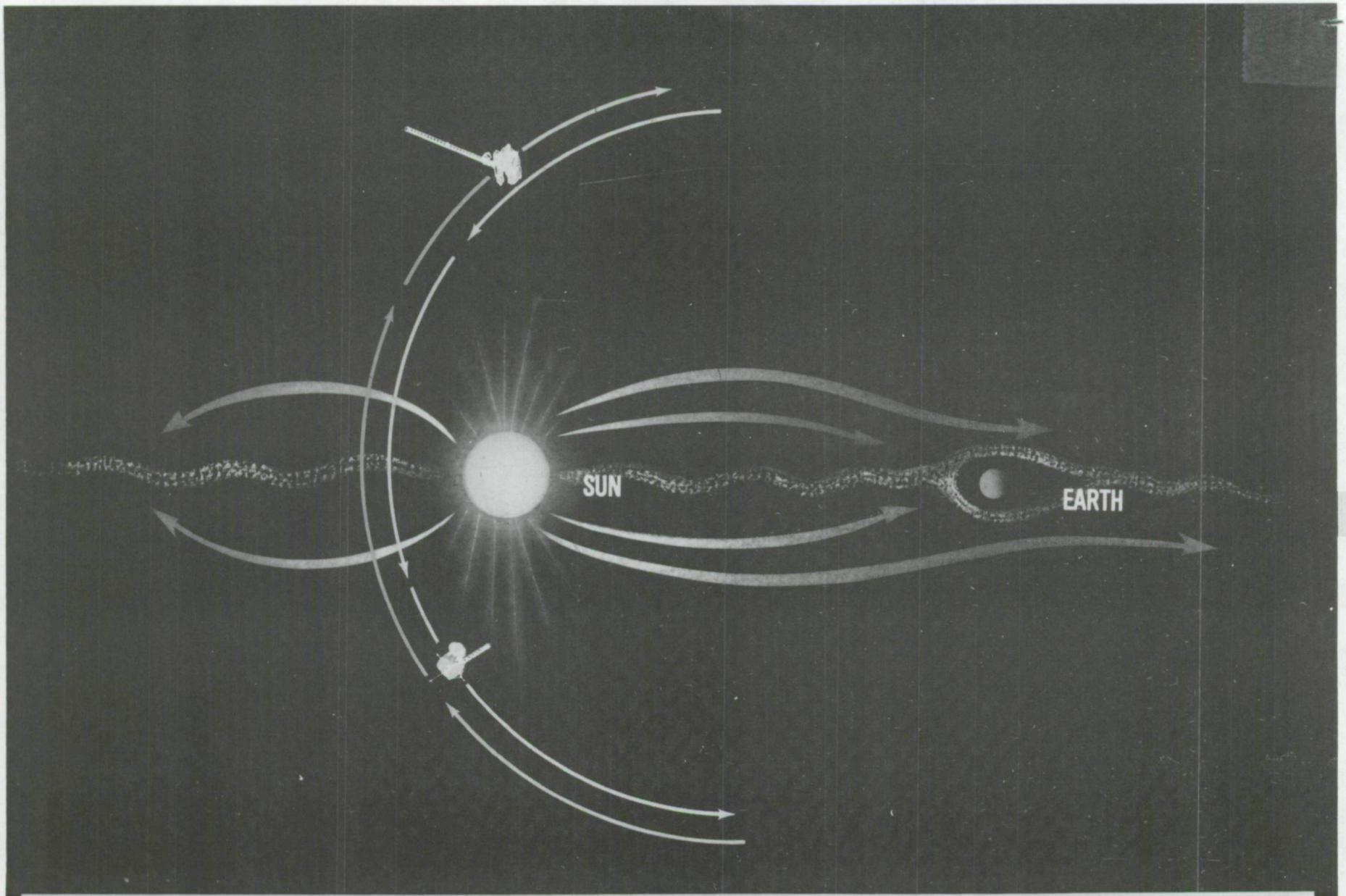

This is an artist's concept of the proposed Solar Polar Mission, a venture to explore the three-dimensional space around the Sun by flying two spacecraft out of the ecliptic (the solar equatorial plane in which the planets lie) and over the poles of the Sun itself. The unmanned mission is expected to contribute important new information on many of the solar phenomena -- solar wind flow, cosmic rays -- that shape and control the space environment of our own Earth.

NASA Photo: 78-H-104